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FERNS

— OF THE —



PACIFIC COAST.

INCLUDING ARIZONA.

A Full Conspectus  Tribes and Genera,

— WITH A —

CLASSIFIED LIST OF THE SPECIES,

— GIVING —

Principal Points of Distinction and Localities of Growth.

BY J. G. LEMMON,

OAKLAND, CAL.

FIRST EDITION.

Single Copies, 33 Cts. Per dozen, \$3.30.

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BACON & COMPANY, PRINTERS,

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1882.

CONSPECTUS

—OF—

PACIFIC COAST FERNS.

INTRODUCTION.

The great *Order of Filices*, or Ferns, is primarily divided into five *Sub-Orders*, based upon the structure, form, and disposition of the spore case, or sporangium.

It happens that the first of these Sub-Orders (*Polypodiaceæ*), includes all the Ferns of the Pacific Coast. This will not be a matter of surprise, when it is seen that nearly all the North American species are of this Sub-Order, as well as $\frac{20}{27}$ of all known species, being about 3,000.

The Sub-Order *Polypodiaceæ* is distinguished from the other four by having the spore-cases stalked; that is, each case is upheld by a little stipe or foot-stalk, corresponding to the peduncle in flowering plants.

The spores are infinitesimally minute cells of protoplasm, endowed with life. They are generated by hundreds in these globular cases, called collectively *Sporangia*—from “spore,” a minute germ, and “angios,” a vessel.

These stalked sporangia are found to be variously arranged upon the frond, either collected into roundish dots or disposed in lines along the veins, or at their ends; also they are covered, more or less, by an indusium composed of the recurved margin of the frond, or by special membranes; and upon these characters are based the distinctions that are seized upon to separate this large group into ten *Tribes*, containing from one to five genera each.

Six of these *Tribes* including fifteen genera are represented on the Pacific Coast. This limitation, it will be found, greatly facilitates acquaintance with this beautiful class of plants.

SYNOPSIS OF TRIBES AND GENERA.—SUB-ORDER POLYPODIACEÆ.

Sporangia globular, or slightly flattened laterally, collected in patches, dots, or lines, called *sori*, of various shapes, all stalked and provided with a vertical, incomplete, many-jointed ring of larger cells, which straightens at maturity, bursting the less firmly united wall plates, and scattering the minute spores. These *sori* are either naked or covered by indusium in several ways.

TRIBE 1, POLYPODIEÆ. Indusium none. *Sori* round or oblong, placed on or at the ends of the veinlets. Stalk articulated to the creeping root; containing but one genus.

1. **POLYPODIUM.** Character same as the Tribe.

TRIBE II, GRAMMITIDEÆ. Indusium none. *Sori* more or less elongated, placed on the under side of the fronds or into divisions, and either following along the veins or collected at their tips, near the margin. Fronds either scaly, tomentose, or powdered beneath. Two genera.

2. **GYMNOGRAMME.** *Sori* much elongated, following the veins, and, like them, often branched.

3. **NOTHOLENA.** *Sori* but little elongated, often of very few sporangia, placed across the veins, near the margins of the frond or its lobes.

TRIBE III, PTERIDEÆ. Involucre consisting of the margin of the frond turned inward, and covering, when young, the *sori*, which are close to the margin or extending down the veins. Five genera.

4. **CHEILANTHES.** *Sori* minute, at the ends of the veins, covered by a usually interrupted involucre. Ferns small, often wooly, scaly, or glandular.

5. **PELLÆA.** *Sori* near the ends of the veins, often confluent. Involucre continuous around the pinules. Sterile and fertile fronds much alike and smooth, the stalk dark-colored.

6. **CRYPTOGRAMME.** *Sori* extending down the free veins. In-

volucre very broad; at length flattened out, exposing the now confluent sori. Sterile and fertile fronds unlike; stalk light-colored.

7. *PTERIS*. Sporangia borne on a continuous, vein-like, marginal receptacle, which connects the ends of the veins. Involucre continuous around the pinules; stalk light-colored.

8. *ADIANTUM*. Sporangia borne at the ends of the veins, on the under side of the reflexed and membranous margin of the frond. Mid-vein of the pinules mostly eccentric or dissipated into forking veinlets. Stalk dark-colored.

TRIBE IV, BLECHNEÆ. Indusium a special membrane usually concave or arched over the sorus, and opened at maturity along the inner edge. Sori more or less elongated, borne on a veinlet or a special receptacle parallel to the midrib. Two genera.

9. *LOMARIA*. Sori continuous from the base of the pinna to its apex. Sterile and fertile fronds unlike. Veins free.

10. *WOODWARDIA*. Sori interrupted, forming a chain-like row each side of the mid-rib. Fronds all alike, and, in our species, very large. Veins reticulated.

TRIBE V, ASPLENIEÆ. Sori more or less elongated, borne on veins oblique to the mid-rib, covered by a special, usually flattened indusium. Indusium attached to the fertile veinlet by the outer edge. Only one genus.

11. *ASPLENIUM*. The only genus represented.

TRIBE VI, ASPIDIEÆ. Sori orbicular, or roundish, on the back, or sometimes on the tip of the fertile veinlets, (naked in *Phegopteris*,) provided with a special indusium, which is variously shaped. Four genera.

12. *PHEGOPTERIS*. Indusium wanting. Sori very small, dot-like, borne on the back of the fruiting veinlets.

13. *ASPIDIUM*. Indusium orbicular or reniform. Sori borne on the backs or at the tips of the veinlets.

14. *CYSTOPTERIS*. Indusium convex, spoon-shaped, fixed across the fertile veinlet, below the sori, reflexing as the fruit ripens.

15. *WOODSIA*. Indusium globular, placed beneath the sorus, and at first enveloping it, then splitting into segments, and turning back.

FERNS OF THE PACIFIC COAST,

INCLUDING ARIZONA,

BEING A SYSTEMATIC CLASSIFIED LIST,

GIVING THE

PRINCIPAL DISTINGUISHING CHARACTERS BY THE ANALYTICAL
METHOD; ALSO THE NOTED LOCALITIES OF GROWTH,
AND THE POPULAR NAMES OF THE SPECIES.

BY J. G. LEMMON,

OAKLAND, CAL.

ORDER FILICES: TRUE FERNS.

Only one of the six Sub-Orders is represented on the Pacific Coast.

POLYPODIACEÆ.

Six of the Ten Tribes are represented.

FIRST TRIBE, POLYPODIEÆ. Only one genus.

POLYPODIUM, L. Polypody ferns.

§ 1. *Eupolypodium*. Veins not uniting.

P. vulgare. L. "Common Polypody." S. F. hills, Yo-Semite.
A cosmopolite.

Var. **occidentale**, Hook. The usual form on the Pacific coast.

P. falcatum, Kellogg. "Kellogg's Polypody," "Licorice fern."
On trees in deep woods, N. Cal. and Coast of Oregon. Rare.

§ 2. *Goniophlebium*. Some of the veins uniting.

P. Californicum, Kaulf. "California Polypody." Coast hills, especially southward.

P. Scouleri, Hook. & Grev. "Leather-leaf Polypody." Sausalito hills, and along the coast, on rocks and trees.

SECOND TRIBE, GRAMMITIDEÆ. Two genera.

GYMNOGRAMME, Desv. "Golden ferns."

Fronds in our species pentangular.

G. triangularis, Kaulf. "California Gold-back." Shady ravines, coast hills, and in the Sierra. Var. **viscosa**. (New variety.) Mts. of San Diego.

G. hispida, Mett. "Hispid Gymnogramme." Around boulders, slopes of Arizona Mts.

NOTHOLÆNA, R. Br.

* Fronds scaly beneath; above, with stellate hairs.

N. sinuata, Kaulf. "Wavy-leaf Notholæna." Tucson, Santa Catalina, and Chiricahua Mts., Ariz., 6,000 ft. alt.

Var. **crenata**, Lemmon. A dwarfed form in exposed situations.

* * Fronds densely tomentose beneath.

N. ferruginea, Hook. "Rusty Notholæna." Rincon Peak, Santa Catalina, and Graham Mts., Ariz., 7,000 ft. alt.

Var. **parvum**, Lemmon. A small form with large naked fruit. Chiricahua Mts., Ariz., Sept. 1881. (New variety.)

N. Parryi, Eaton. "Parry's Notholæna." Mt. San Jacinto, S. Cal., Maricopa Mts., Ariz. Rare.

N. Newberryi, Eaton. "Newberry's Notholæna." Mt. San Jacinto and San Diego, So. Cal. (New Species!)

* * * Fronds powdered beneath.

+ Once pinnate.

++ Lanceolate.

N. Grayi, Davenport. "Gray's Notholæna." Chiricahua Mts. and Mt. Graham, and Catalina Mts., Ariz. 1880. (New Species!)

N. Lemmoni, Eaton. "Lemmon's Notholæna." South and West canyon, Santa Catalina Mts., near Tucson. 1880. (New Species!)

++ ++ Pentangular.

N. candida, Hook. "Bright Notholæna." Slover Mt., S. Cal., Sanoita Val., Ariz.

N. Hookeri, Eaton. "Hooker's Notholæna." Tucson, Patagonia, and Chirricahua Mts., Ariz., 6,000 ft. 1875. (New Species!)

+ + 3—5 pinnate, flexuous.

N. nivea, Desv. "Snowy Notholæna." Tombstone hills, over the mines, Ariz., 6,000 ft. 1880. (New to U. S.)

N. Fendleri, Kunze. "Fendler's Notholæna." Mts. S. E. Ariz., and eastward.

+ + + 3 pinnate, triangular.

N. dealbata, Kunze. "Whitened Notholæna." In calcereous rocks, Chirricahua and Santa Rita Mts., Ariz., 7,000 ft.

Var. **striata**, Lemmon. An elongated form, Apache Pass.

* * * * Fronds naked beneath, triangular.

N. tenera, Gillies. "Brittle Notholæna." Expected in Ariz. Found eastward.

THIRD TRIBE, PTERIDEÆ. Five genera.

CHEILANTHES, Sw. Lip-ferns.

§ 1. *Adiantopsis*. Involucres separated.

C. Californica, Mett. "Cal. Lip-fern"; "Lace fern." Santa Barbara; sparingly along the coast.

§ 2. *Eucheilanthes*. Involucres more or less united.

* Fronds smooth.

C. Wrightii, Hook. "Wright's Lip-fern." Santa Catalina and Chirricahua Mts. and Mt. Graham, Ariz., 5,000—6,000 ft.

* * Fronds glandular.

C. viscida, Davenport. "Sticky Lip-fern." Bluffs of White-water River and Mt. San Jacinto, S. Cal. 1876. (New Species!)

C. Cooperæ, Eaton. "Mrs. Cooper's Lip-fern." Downieville Buttes (1872). Santa Barbara and near Shasta (1875). On limestone rocks. (New Species!)

§ 3. *Physapteris*. Involucres continuous.

* Fronds tomentose beneath.

C. gracillima, Eaton. "Graceful Lip-fern." Webber Lake, Lassen's Peak, Yo-Semite, Shasta, etc., 7,000 to 9,000 ft.

* * Fronds tomentose above, also.

C. lanuginosa, Nutt. "Woolly Lip-fern." Mt. Graham and Chirricahua Mts., S. E. Ariz. and W. Texas.

C. tomentosa, Link. "Webby Lip-fern." N. E. Ariz. Doubtful. (Largest of the genus.)

* * * Fronds tomentose and scaly beneath.

C. Eatoni, Baker. "Eaton's Lip-fern." Santa Catalina and Chirricahua Mts. and Mt. Graham, Ariz.

Var. **amabilis**, Lemmon. A lovely form with large, naked fruit.

Chirricahua Mts. Sept. 1881. (New variety.)

C. Lindheimeri, Hook. "Lindheimer's Lip-fern." Sunny slopes, Santa Catalina and Chirricahua Mts., and others, Ariz.

* * * * Fronds very scaly beneath; no hairs.

C. Fendleri, Hook. "Fendler's Lip-fern." Santa Catalina and Chirricahua Mts. and Mt. Graham, Ariz., 8,000 ft.

C. Parishii. Davenport.

"Parish's Lip-Fern." Mohave Desert, Cal. 1880. (New species.)

* * * * Scales conspicuously ciliated.

C. myriophylla, Desv. "Elegant Lip-fern." Webber Lake, Mt. Lassen, and Mt. Stanford, 8,500 ft.

C. Clevelandi, Eaton. "Cleveland's Lip-fern." 1876 (N. Sp.!) San Diego Mts.

§ 4. *Aleuriopteris*. Involucres various, powdered.

C. argentea, Hook. "Silvery Lip-fern." Alaska. Very rarely collected.

PELLÆA, Link. Cliff-brakes.

§ 1. *Cheilopteleon*. Involucre becoming unfolded.

P. Breweri, Eaton. "Brewer's Cliff-brake." Mt. Dana, 12,500 ft. Yo-Semite Peaks. Very Rare.

§ 2. *Allosorus*. Involucre conspicuous remaining arched.

* Pinules not mucronate.

+ Once pinnate.

P. atropurpurea, Link. "Clayton's Cliff-brake." Sand-wash of creek, Mt. Graham. N. slopes, Santa Catalina and Chirricahua Mts., S. E. Ariz.

P. aspera, Baker. "Stiff Cliff-brake." Rare in N. Mex. Perhaps in Ariz.

+ + 3-4 pinnate.

P. andromedæfolia, Fée. "Andromeda Cliff-brake." San Bernardino, Santa Barbara, and northward. Com.

P. pulchella, Fée. "Pretty Cliff-brake." Rare in New Mex. Expected in Ariz.

* * Pinules mucronate.

+ Fronds about twice pinnate.

P. ternifolia, Link. "Trifoliate Cliff-brake." Western Texas. Expected in Ariz.

P. Wrightiana, Hook. "Wright's Cliff-brake." Along stream beds. Chirricahua, Santa Catalina, and Mt. Graham.

Var. **Californica**, Lemmon. A small form with narrow pinnæ San Bernardino Mts., Cal.

P. brachyptera, Baker. "Strict Cliff-brake." Claremont Peak, Plumas Co., San Bernardino, Cal., 6,000 ft.

+ + Fronds tripinnate.

P. Ornithopus, Hook. "Bird-foot Cliff-brake." San Bernardino Plains, Coast and Sierra foot-hills.

P. densa, Hook. "Oregon Cliff-brake." Mt. Standford, Scott Mt. to Shasta. Rare.

§ 3. *Platyloma*. ^{narrow, pinules} Involucres [^] broad and flat.

P. Bridgesii, Hook. "Bridges' Cliff-brake." Webber Lake, 7,800 ft. Rare northward.

P. flexuosa, Link. "Zig-zag Cliff-brake." Santa Catalina, Chirricahua, and Mt. Graham foot-hills, Ariz.

CRYPTOGRAMME, R. Br. "Rock-brakes."

C. acrostichoides, R. Br. "American Rock-brake." Webber Lake, Gold Lake, Cal., and northward, 8,500 ft.

PTERIS, L. "Bracken," "Eagle fern."

P. aquilina, L.

Var. **lanuginosa**, Bong. "Woolly Eagle fern." Sierra valley; throughout the Pacific coast. Com.

ADIANTUM, L. "Maiden Hair."

* Fronds plume-shaped or deltoid.

A. capillus-Veneris, L. "Venus' Maiden Hair." Santa Barbara, Yo-Semite, etc.; beside streams and cascades. Com.

A. emarginatum, Hook. "California Maiden Hair." Mare Island, San Bernardino, etc.; in shady canyons.

A. tricholepis, Fée. "Soft Maiden Hair." Reported in early explorations from S. Cal.

* * Fronds forked, lunate and circular in outline.

A. pedatum, L. "American Maiden Hair." Beside waterfalls and streams. Yo-Semite, etc. Com.

FOURTH TRIBE, BLECHNEÆ. Two genera.

LOMARIA, Willd. "Deer ferns."

L. Spicant, Desv. "Oregon Deer fern." Coos Bay, Or., N. Cal. Rare.

WOODWARDIA, Smith. "Chain ferns."

W. radicans, Sm. "Great Chain fern." Our largest fern. Along streams. S. Cal. Common.

FIFTH TRIBE, ASPLENIEÆ. Three genera.

ASPENIUM, L. "Spleen-worts."

§ 1. *Euasplenium*. Indusium straight.

A. trichomanes, L.

Var. *incisum*. "Dwarf Maiden Hair."

San Diego, Cal. Rare on this coast.

A. septentrionale, Hoff. "Northern Spleen-wort." Reported from Ariz. by early explorers.

A. firmum, Kunze. "Rigid Asplenium." N. slope Santa Catalina Mts., Ariz.

§ 2. *Athyrium*. Indusium variously curved.

A. filix-fœmina, Bernh. "Lady fern."

Var., *exile*. Near Shasta, Cal.

" *augustum*. Sierra valley, Cal.

" *cyclosorum*. San Joaquin and Sacramento Rivers, Cal.

SIXTH TRIBE, ASPIDIEÆ. Four genera.

PHEGopteris, Fée. "Beech ferns."

P. Dryopteris, Fée. "Oak-leaved fern." Cypress swamps, Oregon, N. Cal. and Alaska.

P. alpestris, Mett. "Alpine Beech fern." Webber Lake, Lassen's Peak, Mt. Standford, Cal. 8,500 ft. Rare.

ASPIDIUM, Sw. "Shield ferns."

§ 1. *Nephrodium*. Indusium kidney-shaped.

* Fronds membranous, decaying in autumn.

A. Nevadense, Eaton. "Sierra Shield fern." 1878. (N. Sp.!) Butterfly Valley, Webber Lake, and Trinity Mts., Cal. Very rare and beautiful.

A. patens, Sw. "Spreading Wood fern." Glen Loch, Santa Barbara, Cal. and Santa Catalina Mts., Ariz.

* * Fronds subcoriaceous, evergreen.

A. rigidum, Sw.

Var., **argutum**, Eat. "Rigid Wood fern." Oakland hills, Coast and Sierra foot-hills, Cal.

A. spinulosum, Sw. "Spinulose Wood fern."

Var., **dilatatum**. "Oregon Wood fern."

Astoria, Coos Bay, Oregon.

§ 2. *Polystichum*. Indusium orbicular, fixed by the centre.

* Fronds once pinnate.

A. munitum, Kaulf. "Chamisso's Shield fern."

Var., **nudatum**. Yo-Semite, Cal.

" **imbricans**. Near Shasta, Cal.

" **inciso-seratum**. Oregon and Monterey, Cal.

* * Pinna nearly or quite pinnatifid.

A. mohrioides, Bory. "New Shasta Shield fern." Mt. Eddy, Head-waters Sacramento River; near Shasta, Cal. 1879. (New Species!)

Var., **scopulorum**, with the above.

A. aculeatum, Sw. "Prickly Shield fern."

Var., **Californicum**. Santa Cruz, Cal.

" **lobatum**. Coast ranges, Cal.

" **angulare**. Santa Cruz, Cal.

CYSTOPTERIS, Bernh. "Bladder fern."

C. fragilis, Bernh. "Brittle fern." Webber Lake, Cal. and northward. Common.

WOODSIA, R. Br. "Woodsia."

W. Obtusa, Torr. "Obtuse-leaved Woodsia." Mt. Graham, 9,000 ft., and Santa Catalina, 10,000 ft., Ariz. Aug. '80.

Var. **nana**, Lemmon. Deer park on the summit of the Santa Catalina Mts.

W. scopulina, Eat. "Rocky Mt. Woodsia." Webber Lake, Sierra Co., Cal.

W. Oregana, Eat. "Oregon Woodsia." Modoc lava beds. Cal. to Mt. Graham, Arizona.

W. Mexicana, Fée. "Mexican Woodsia." Chiricahua Mts., S. E. Ariz. 1881. (New to the U. S.)

W. Plummeræ, Lemmon. "Mrs. Lemmon's Woodsia." Near Fort Bowie, Chiricahua Mts., Ariz. 1881. (New Species!)

FERN ALLIES.

ORDER OPHIOGLOSSACEÆ.

Only two genera.

BOTRYCHIUM, Sw. "Grape ferns."

§ 1. *Eubotrichium*. Sterile division fleshy.

B. simplex, Hitch. "Hitchcock's Moon-wort." Yo-Semite.
Reported from Ariz.

B. ternatum, Sw.

Var., **australe**. "Southern Grape fern."

Butterfly Valley, Lake Tahoe, and northward.

§ 2. *Osmundiopteris*. Sterile division membranous.

B. Virginianum, Sw. "Virginian Grape fern." Near Yo-Semite, Cal. and Santa Rita Mts., Ariz. Rare on this coast.

OPHIOGLOSSUM. "Adder-tongue."

O. vulgatum, L. "Common Adder-tongue." Hermitage Ranch, Chiricahua Mts., Ariz., 1881. Rare on Pacific coast.

ANNOUNCEMENT.

Mrs. J. G. Lemmon contemplates publishing a "Manual of Pacific Ferns," as soon as the necessary illustrations can be prepared. This work will give complete descriptions, both technical and popular, and, it is believed, will supply a long-felt want on this coast.

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